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Series of components for a vehicle seat5           SERIES OF COMPONENTS FOR A VEHICLE SEATBACKGROUND AND SUMMARY OF THE INVENTION

10       This application is a National Phase of  
PCT/EP2004/012004, filed October 23, 2004, and claims  
the priority of German patent application number DE 103  
50 148.7, filed October 28, 2003, the disclosure of  
which is expressly incorporated by reference herein.

15       The invention relates to a series of components for a  
vehicle seat of a motor vehicle ~~according to the~~  
~~precharacterizing clause of claim 1.~~

20       A cushion with a cushion core and an air- and moisture-  
permeable cover layer pulled over the latter is known  
from the German patent application ~~with the official~~  
~~application~~ number 102 43 315.16 ~~and the application~~  
~~date of~~ and filed 09.18.2002, which has still not been  
published up to the application date of the present  
25       patent application. To improve the climate comfort,  
longitudinal and transverse grooves are formed in the  
surface of the cushion core, ~~which.~~ The surface is  
covered by the cover layer, ~~[[said]]~~ the longitudinal  
and transverse grooves ~~[[being]]~~ are spaced apart from  
30       one another, and also being open toward the cover layer  
and intersecting one another. In this case, the  
longitudinal and transverse grooves described are  
~~designed as~~ ventilation ducts. In addition, ventilation  
channels which penetrate the full core thickness of the  
35       cushion core ~~[[and]]~~ while, on ~~[[the]]~~ one hand,  
~~[[open]]~~ opening in the intersecting points of  
longitudinal and transverse grooves and, on the other

hand, [[open]] opening freely on the outside of the cushion core are provided in the cushion core. In addition, a fan for subjecting a central cushion region to air can be arranged either on that side of the cushion core which faces away from the cover layer, and  
5 at a distance from [[said]] the cushion core, or in a channel completely penetrating the cushion core. The intensive air flow achieved thereby in the longitudinal and transverse grooves permits a rapid removal of heat  
10 and moisture.

DE 200 02 447 U1 discloses a seat cushion for vehicle seats, in particular for vehicle seats with a core part made from a plastic foam. On its upper side facing a  
15 seat surface, the core part has duct-like depressions which bring about zonal weakenings and, as a result, configure the seat surface in accordance with the required pressure ratios. It is furthermore provided to permit, at least partially, a circulation of air in the  
20 duct-like depressions. Movement of the seat user on the seat cushion during the journey causes an air flow produced by a type of pumping action to arise in the duct-like system of the core part, [[said]] with the air flow transporting the moist air to the outside  
25 through a vertical opening in the foam cushion part. In order to reinforce the ventilation effect of the vehicle seat, a ventilator can additionally be arranged in the region of a lower mouth opening of a main duct which connects the duct-like depressions to a lower  
30 side lying opposite the seat surface. In contrast to a passively ventilated vehicle seat, the actively ventilated vehicle seat has the described main duct with the ventilator arranged therein. Accordingly, a passively ventilated vehicle seat is constructed in a  
35 structurally different manner from an actively ventilated vehicle seat.

DE 33 06 871 A1 discloses a cushion with an air-permeable cover layer. In the case of the cushion, ducts or flexible tubes which run on or in the core and have air-permeable walls bring about an intensified  
5 exchange of air in the regions on which a person is sitting, leaning or reclining, which prevents too great a rise in temperature of the cushion surface. The cushion has ventilation ducts which run in the seat region and/or backrest region and/or reclining region  
10 under the cover layer and which can be connected via ventilation channels which are arranged transversely thereto and, in turn, are connected to an air extraction ~~[[means]]~~ apparatus. According to the variant embodiment with the vertical ventilation  
15 channels, it is provided to let them either all open freely on an outside of a seat shell or else to let all of the ventilation channels open freely on an inside of the seat shell and to extract the air from the inside of the seat shell via a main connecting hose.

20

~~[[The]]~~ An object of the present invention is concerned with the problem of indicating an improved embodiment for a series of to provide improved components for a motor vehicle seat of the type mentioned at the  
25 beginning, in which, in particular, a manufacturing process is simplified and/or made more economical.

This object ~~[[is]]~~ has been achieved ~~by the subject matters of the independent claims, and advantageous refinements are the subject matter of the dependent claims.~~  
30

~~The invention is~~ based on the general concept, in the ease of a series of components for a vehicle seat which  
35 has a cushion core with ventilation ducts running along and inside a seat surface and/or backrest surface, and with ventilation channels which are arranged

essentially transversely thereto, of providing, in  
~~order to realize an~~ either an actively or passively  
ventilated vehicle seat, just one cushion core which  
can be adapted to particular requirements of an  
5 actively or a passively ventilated vehicle seat. In  
this ~~[[case]]~~ arrangement, the ventilation ducts  
communicate with the ventilation channels which are  
arranged essentially transversely thereto, penetrate  
the entire thickness of the cushion core and extend  
10 from the ventilation ducts as far as a rear wall facing  
away from the seat surface and/or backrest surface.

According to the invention, in ~~order to realize a~~  
passively ventilated vehicle seat, the ventilation  
15 channels are connected in a flow-permeable manner to  
the surroundings via an opening in the rear wall, for  
example of a seat shell, ~~whereas, in order to realize.~~  
In an actively ventilated vehicle seat, at least one  
fan, for example in the form of a ventilator or a  
20 miniature ventilator, is provided and at least one of  
the ventilation channels being closed.

The ~~solution according to the~~ present invention  
therefore provides a cushion core which can be used  
25 both for an active vehicle seat ventilation using  
ventilators, and also for a passive vehicle seat  
ventilation. In the case of the passive vehicle seat  
ventilation, the essentially horizontally running  
ventilation ducts on the upper side of the cushion core  
30 are supplied with air by ~~[[the]]~~ a multiplicity of  
ventilation channels which are connected in terms of  
flow to the surroundings via an opening in the rear  
wall. In ~~the case of~~ the actively ventilated vehicle  
seat, a fan is additionally provided ~~which is~~ and  
35 arranged, for example, within a ventilation channel or  
in the region of a mouth of the ventilation channel,  
~~that is to say i.e.,~~ in the region of the opening in

the rear wall of the vehicle seat, ~~and supplies to~~  
supply the associated ventilation channel with air. In  
this case, some of the ventilation channels are ~~[[of]]~~  
closed ~~design~~, thus producing a circulation of the air  
5 blown in or extracted through the ventilators. The  
ventilator described can be ~~designed~~ configured here ~~in~~  
~~a manner~~ such that the flow direction ~~of flow~~ can be  
reversed.

10 The ~~solution according to the~~ invention therefore  
affords the great advantage of providing an identical  
basic cushion core both for a passively ventilated  
vehicle seat and for an actively ventilated vehicle  
seat~~[[, said]]~~. The basic cushion core ~~[[being]]~~ is  
15 adapted in a further machining step to the respective  
requirements of the active or passive vehicle seat  
ventilation. As a result, the number of components to  
be provided is reduced, thus making it possible to save  
on costs and simplifying the manufacturing process.

20 According to a currently preferred embodiment of the  
invention, each cushion core has, on its rear wall, a  
flow-impermeable layer which, in order to realize the  
passively ventilated vehicle seat, is pierced or  
25 removed in the mouth region of at least one ventilation  
channel. Accordingly, ~~in the case of this variant~~  
embodiment, a cushion core ~~is provided which~~  
corresponds in its basic design to that of the actively  
ventilated vehicle seat~~[[,]]~~ and ~~in the case of~~ which  
30 it is only necessary to provide openings in the mouth  
region of at least one ventilation channel in order to  
adapt it to an actively ventilated vehicle seat. The  
provision of these openings can be achieved, for  
example, by a simple piercing or boring through of the  
35 flow-impermeable layer or else also by removing the  
flow-impermeable layer in the region mentioned.

According to ~~an alternative~~ another embodiment of the ~~solution according to~~ the invention, each cushion core has, on its rear wall, a respective opening in the mouth region of the ventilation channels, ~~[[of]]~~ in  
5 which, ~~in order to realize~~ for the actively ventilated vehicle seat, at least one is closed. In this ~~[[case]]~~ embodiment, it is therefore envisaged ~~providing to provide~~ a basic cushion core which is suitable without finishing work for a passively ventilated vehicle seat.  
10 For the actively ventilated vehicle seat, at least one of the rear-wall openings of the ventilation channels has to be closed, which can be achieved, for example, by simply sticking a film over the openings and/or by inserting a stopper into the ventilation channel.

15 According to an advantageous development of the ~~solution according to~~ the invention, the flow-impermeable layer can be ~~designed as~~ a plastic layer and/or as a felt layer. Plastic layers and felt layers  
20 can be produced cost-effectively and in virtually any desired embodiment and can be processed in a simple manner. While a plastic layer is ~~designed~~ selected in a manner such that it is virtually entirely flow-impermeable, ~~in the case of~~ for the felt layer, a very  
25 low flow permeability may also be specified, depending on the ~~embodiment~~ requirement.

According to a particularly preferred embodiment of the invention, the plastic layer is ~~designed as~~ a film. ~~A film of this type~~, preferably a self-sticking film,  
30 which can be applied simply, rapidly and cost-effectively to the rear wall of the vehicle seat and, as a result, can reliably close the openings of the ventilation channels. At the same time, however, a  
35 subsequent removal or piercing of the film in order to open the ventilation channels is simply and easily possible achievable.

According to an advantageous development of the invention, an arrangement of the ventilation ducts and/or ventilation channels is adapted to a body pressure distribution and/or to body contact points. This embodiment brings about an optimum adaptation of the ventilation capacity to the human anatomy or to the anatomy of a standard vehicle occupant. In this connection, for example, regions of the vehicle seat which are subjected to a heavier load, for example in the region of a human protuberance, can be ventilated better and, as a result, can have a positive influence on the well-being of the seat user.

A controllable ventilation channel closure can expediently be provided which interacts with the fan and permits either an active or a passive ventilation of the vehicle seat. A controllable ventilation channel closure of this type permits the realization of a vehicle seat which can be ventilated both passively and actively. For a passive vehicle seat ventilation, the fan is switched off and at the same time at least some of the openings of the ventilation channels are opened, ~~whereas, for.~~ For an active vehicle seat ventilation, the fan is switched on and at least some of the ventilation channels are closed. In this embodiment, it is ~~conceivable~~ contemplated for a selection switch to choose between active and passive seat ventilation to be arranged, for example, on the dashboard or on the seat~~[[, said]]~~. The selection switch ~~controlling~~ controls both the opening and the closing of the ventilation channels, and also the switching off and on of the fan. The opening and closing of the ventilation channels can take place via a simple slide, for example a perforated plastic part offset with respect to the openings. Such a selection possibility choosing between active and passive vehicle

seat ventilation increases the driving comfort and the functionality of the vehicle seat.

5 Other objects, advantages and novel features of the present invention will become apparent from the following detailed description of the invention when considered in conjunction with the accompanying drawings.

10 BRIEF DESCRIPTION OF THE DRAWINGS

~~Further important features and advantages of the invention emerge from the subclaims, from the drawings and from the associated descriptions of the figures with reference to the drawings.~~

15 ~~It goes without saying that the features mentioned above and those which have yet to be explained below can be used not only in the respectively stated combination but also in other combinations or on their own without departing from the context of the present invention.~~

25 ~~Preferred exemplary embodiments of the invention are illustrated in the drawings and are explained in more detail in the descriptions below, with identical reference numbers referring to identical or similar or functionally identical components.~~

~~In the drawings:~~

30 Fig. 1 ~~[[shows]]~~ is a plan view of a seat surface of a vehicle seat with ventilation ducts,



Fig. 2 ~~[[shows]]~~ is a ~~cross-section~~ cross-sectional  
view through a seat surface of a cushion core  
according to the invention with passive seat  
ventilation, and

5

Fig. 3 ~~[[shows]]~~ is a ~~cross-section-as-in~~ cross-  
sectional view similar to Fig. 2, but with  
active seat ventilation.

10 DETAILED DESCRIPTION OF THE DRAWINGS

A vehicle seat 1 has, in a known manner, a seat part  
and a backrest, with only the seat part of the vehicle  
seat 1 ~~being illustrated in~~ needing to be illustrated  
Figs 1 to 3. However, the construction described below  
15 and the operation apply in the same manner to the  
backrest part of the vehicle seat 1, as will be readily  
apparent to one skilled in the art.

According to Fig. 1, the seat part of the vehicle seat  
20 1 has an upper seat surface 3, which can be relieved in  
~~a manner~~ an ergonomic manner for sitting, and a cushion  
core 2, which can be formed, for example, from a  
flexible plastic.

25 According to the invention, on its upper side facing  
the seat surface 3, the cushion core 2 has ventilation  
ducts 4 which run along and on the inside of the seat  
surface 3. In this case, the various ventilation ducts  
4 can be arranged regularly (i.e., in a specific  
30 pattern) and can form a "duct grid" 11. However, an  
arrangement of the ventilation ducts 4 which is adapted  
to a body pressure distribution and/or to body contact  
points is also ~~conceivable~~ contemplated.

35 ~~According to~~ As seen in Fig. 1, the ventilation ducts 4  
~~[[run]]~~ extend essentially ~~[[in]]~~ to the region of the

seat surface 3, but they may, however also be guided over a cheek region 14 of the motor vehicle 1.

Ventilation channels 5 are arranged transversely to the  
5 ventilation ducts 4 ([[cf.]] as seen in Figs 2 and 3)[[, said]]. The ventilation channels penetrating  
penetrate the entire thickness of the cushion core 2  
and extending extend from the ventilation ducts 4 as  
far as a rear wall 6 which faces away from the seat  
10 surface 3. The ventilation ducts 4 and the ventilation  
channels 5 can be directly formed during the foaming of  
the cushion core 2.

The special network formed from a duct grid 11 of  
15 ventilation ducts 4 and ventilation channels 5  
communicating therewith ensures an effective  
transportation of the sweat moisture, produced by a  
vehicle occupant, essentially away from the seat  
surface 3, toward the rear wall 6 of the cushion core  
20 2.

~~According to~~ Fig. 1[[],] shows the ventilation channels  
5 open in intersecting points 15 of the ventilation  
ducts 4 or of the duct grid 11.

25

~~According to the invention, it is now provided, in~~  
~~order to realize~~ for a passively ventilated vehicle  
seat 1, ~~to connect~~ the ventilation channels 5 are  
connected in a flow-permeable manner to the  
30 surroundings via an opening 7 in the rear wall 6. A  
continuous movement of the seat user on the seat  
surface 3 during the journey causes an air flow  
produced by a pumping action in the duct-like system of  
the ventilation ducts 4 and the ventilation channels 5,  
35 [[said]] with the air flow transporting the moist air  
through the openings 7 into the surroundings. For the  
passively ventilated vehicle seat 1 illustrated in Fig.

2, an additional ventilator 8 is advantageously not required.

By contrast, ~~in order to realize~~ for an actively  
5 ventilated vehicle seat 1 ~~according to~~ shown in Fig. 3,  
a ventilator or a fan 8 is provided and at the same  
time at least one of the ventilation channels 5 is  
closed. In this case, the closure of the ventilation  
channels 5 can take place by ~~[[means]]~~ way of a flow-  
10 impermeable layer 9 which is arranged on the rear wall  
6, or else by stoppers which are inserted into the  
particular ventilation channels 5. The fan 8 for the  
actively ventilated vehicle seat 1 according to Fig. 3  
can be arranged either within the cushion core 2, i.e.  
15 within a correspondingly shaped ventilation channel 5,  
or else outside the cushion core 2 and spaced apart  
from the rear wall 6. A plurality of miniature  
ventilators (not illustrated) which are arranged in  
various ventilation channels 5 are also ~~conceivable~~  
20 contemplated here. The fan 8 can furthermore produce  
both a suction action and a pressure action within the  
duct system.

~~It is essential for~~ To implement the invention ~~[[that]]~~  
25 the cushion core 2 is designed equally both for the  
actively ventilated and for the passively ventilated  
vehicle seat 1 and only has to be adapted subsequently  
to the particular requirements with regard to the  
actively or passively ventilated vehicle seat 1. This  
30 contributes substantially to reducing the multiplicity  
of parts and therefore to a lowering of the costs.

Two examples of possibilities for adapting the cushion  
core 2 to an actively ventilated or a passively  
35 ventilated vehicle seat 1 are to be explained  
below~~[[:]]~~.

According to a first ~~variant~~ embodiment, ~~it is provided~~  
~~that~~ each cushion core 2 has, on its rear wall 6, a  
flow-impermeable layer 9 which, ~~in order to realize for~~  
the passively ventilated vehicle seat 1, is pierced or  
5 removed in the mouth region 10 of at least one  
ventilation channel 5. In this case, ~~it is therefore~~  
~~provided to produce~~ a cushion core 2 is produced which  
is always identical and in which the mouth regions 10  
of the ventilation channels 5 are closed at the factory  
10 by the flow-impermeable layer 9. If, in the case of  
extras, an actively ventilated vehicle seat 1 is  
desired, then openings 7 are subsequently bored and/or  
pierced through the flow-impermeable layer 9 in the  
mouth region 10 of the ventilation channels 5. It is  
15 also ~~conceivable~~ contemplated for the flow-impermeable  
layer 9 to have pre-punched regions in the region of  
the openings 7, ~~which.~~ These regions can be removed  
particularly easily, or for the entire layer 9 to be  
able to be removed or pulled off in a simple manner as  
20 a type of pull-off film.

According to a second ~~variant~~ embodiment, each cushion  
core 2 has, on its rear wall 6, a respective opening 7  
in the mouth region 10 of the ventilation channels 5,  
25 with, ~~in order to realize for~~ the actively ventilated  
vehicle seat 1, at least one of the openings 7 being  
closed. In this ~~[[case]]~~ embodiment, a cushion core 2  
which is always identical is therefore produced which  
can be installed without changes in a passively  
30 ventilated vehicle seat 1. If, as an extra, an actively  
ventilated vehicle seat 1 is desired, then at least one  
opening 7 has to be closed, for example, by ~~[[means]]~~  
way of a stopper or by sticking it together or sealing  
it with a film or layer 9. Furthermore, the actively  
35 ventilated vehicle seat 1 additionally requires the  
above-described fan 8.

A plastic layer and/or a felt layer are suitable examples of a flow-impermeable layer 9, with it being possible contemplated for the plastic layer to be designed, for example, ~~[[[as]]~~ a film. In particular, a self-sticking film affords the great advantage of being able to be applied simply and rapidly to the rear wall 6.

According to Fig. 3, ~~in the case of~~ for the actively ventilated vehicle seat 1, at least one inflow channel 12 is provided through which ambient air passes into the vehicle seat 1, and at least one outflow channel 13 is provided through which air passes from the vehicle seat 1 into the surroundings. The definition of the inflow channel 12 or of the outflow channel 13 is oriented here to a flow direction of the fan 8. Generally, provision is made to arrange closed ventilation channels 5 between the inflow channel 12 and the outflow channel 13, so that an improved loop of the flowing air, i.e. improved circulation, is achieved within the cushion core 2.

For higher quality equipment lines, a controllable ventilation channel closure (not illustrated) can also be provided ~~which interacts~~ to interact with the fan 8 and ~~permits~~ permit either an active or passive ventilation of the vehicle seat 1. In the case of a passive ventilation of the vehicle seat 1, the fan 8 is switched off and at least a majority of the openings 7 in the mouth region 10 of the ventilation channels 5 is opened. For an active ventilation of the vehicle seat 1, the fan 8 is switched on and at the same time at least some of the openings 7 of the ventilation channels 5 are closed. The closing or opening of the ventilation channels 5 can take place, for example, by ~~[[means]]~~ ]] way of a grid of holes arranged offset with respect to the openings 7. Furthermore, both a

manual and an automatic switching over between active and passive seat ventilation, for example by ~~means of~~ way a switching element on the seat or on the dashboard, is ~~conceivable~~ also contemplated here.

5

In summary, the essential features of the solution according to the invention can be characterized as follows[[:]].

10 ~~The invention makes provision, in the case of~~ For a series of components for a motor vehicle seat 1 ~~of a motor vehicle, to provide~~ an identical cushion core 2 is provided both for passive ventilation and for active ventilation, ~~which.~~ The cushion core has ventilation  
15 ducts 4 and ventilation channels 5 which are arranged transversely thereto, penetrate the entire or overall thickness of the cushion core 2 and extend from the ventilation ducts 4 as far as a rear wall 6 facing away from the seat surface 3. ~~In order to realize~~ For a  
20 passively ventilated vehicle seat 1, the ventilation channels 5 are connected in a flow-permeable manner to the surroundings, whereas, in ~~the case of~~ an actively ventilated vehicle seat 1, a fan 8 is additionally provided and at least one of the ventilation channels 5  
25 is closed.

The solution according to the invention therefore affords the great advantage of just one identical cushion core 2 ~~[[being]]~~ is provided both for the  
30 actively and for the passively ventilated vehicle seat 1 ~~[[, said]]~~. The cushion core being able to be adapted in a simple manner to the respective requirements of a passive or active ventilation of the vehicle seat 1.

35 The foregoing disclosure has been set forth merely to illustrate the invention and is not intended to be limiting. Since modifications of the disclosed

embodiments incorporating the spirit and substance of  
the invention may occur to persons skilled in the art,  
the invention should be construed to include everything  
within the scope of the appended claims and equivalents  
5 thereof.